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OUR PORTRAIT GALLERY.

WE add to our portrait gallery in this number of the PETROLEUM MONTHLY, a sketch of W. W. BLOSS, the "Pioneer editor of the oil region." Perhaps in justice to Mr. W. R. Johns, of Oil City, this remark should be qualified, for Mr. Johns was unquestionably one of the earliest, if not the first, to establish a weekly journal, although Mr. Bloss was the projector of the first *daily* newspaper in the oil region.

For the meagre details of this sketch we are indebted to a friend, who, in the absence of the "subject," at the time of closing our columns, kindly furnished the following:

Mr. Bloss is a native of Rochester, New York. At an early age he became a practical printer, but after fully mastering the art abandoned the business, and became a contributor and correspondent for the *Metropolitan* and local press.

In 1857 he removed to Kansas, and there engaged in the newspaper profession, and shared to a large extent in the difficulties and dangers which at that time beset all enterprises which were identified with the Free State party.

In 1859 he returned to Rochester, New York, and there became editorially connected with the *Express*, then a lively and energetic Republican newspaper, and now recognized as among the largest and most influential journals of western New York.

At the commencement of the rebellion Mr. Bloss entered the military service of the United States, as 1st Lieut. in the 108th Regt. of New York Volunteers. At the battle of Antietam he was severely wounded, and received honorable mention in the official reports of that engagement. Shortly after, he resigned his commission and returned to Kansas, and reëntered the service as Captain on General Dentzler's staff. While serving in this capacity he was also brevetted Major of New York Volunteers by Governor Fenton, and served until the close of the war.

In the spring of 1865 Mr. Bloss came to Titusville, where he purchased the *Petroleum Reporter*, then a weekly journal of less than 500 circulation. In June, 1865, in company with his brother, H. C. Bloss, he started the *Morning Herald*, and in the fall of the same year, Col. J. H. Cogswell became a member of the firm.

Of the latter newspaper enterprise few words are necessary; the *Herald* speaks for itself, and has acquired an influence and popularity seldom awarded to country journals. The difficulties attendant upon its birth were numerous and disheartening. Lacking capital at the start, when most needed, and with an uncertainty pertaining to all branches of business peculiar to the oil region at that time, owing to the great commercial revolutions of 1865, nearly all predicted the early demise of the *Herald* and failure of its owners. But from the date of its first publication to the present it has never missed a regular publication day, and is at the present time more prosperous than ever before.

It was said of Wm. Bradford, the Quaker printer who came over with Penn, and set up the first press in America, that at the time of his death it was announced in his *Gazette*, "That being quite worn out with old age and labor, his lamp of life went out for want of oil." But of the subject of our sketch, who is in the very prime of life, may no such sorrowful eulogy ever be pronounced, certainly not in this land of "oil" and plenty, in which he has labored for its interest and advancement.

THE OIL REGION OF CANADA.

At the present stage of the history of Petrolia generally, it might be regarded as an opportune time to give such a description of the oil region of Canada as would let the outside public know something of the importance of the interests there—the rapid development and progress of the last two years; of the steady, systematic business that oil seeking is now; and of the great future which the Enniskillen oil fields undoubtedly have before them.

To those whose ideas have been formed from what it was when speculation ran high, consequent upon the first new developments, and high prices the article once or twice reached; with all the incidents of fortunes made and lost in a day and collapse of many pioneering schemes, an exposition of the real state of matters now will prove both interesting and valuable. We are indebted to the *Petrolia Advertiser* for the following:

Mr. Williams, of Hamilton, who may be justly regarded as the father of the Canadian oil business, commenced operations in Oil Springs much about the same time the Pennsylvanian oil fields began to be worked; and for a time the oil fields of Enniskillen were before the notice of the world even more than those of Pennsylvania. Never has there such a quantity of oil been produced from the same area of ground as in Oil Springs during the flowing well period; but the precious article was criminally wasted,—hundreds of thousands of barrels, some say even millions, were allowed to run down the creek there, being an absolute national loss.

Here the difference between the oil of Pennsylvania and that of Canada, began to show itself. After supplying the local demand, that of the States could be exported freely, while, from the unpleasant odor of the Canadian oil, peculiar to itself, its consumption was confined to the limits of Canada. The local markets being very quickly glutted, crude production was checked. No systematic development was carried on. Undue depression or activity, according to the season, prevailed; and the extremes of prices were so great and so rapid as always to give the business more of a gambling character than anything else. Matters continued that way until the summer of 1865, when consumption had so much increased, and production had so little been stimulated, that an abnormally high price was got for the article. Bothwell, at which point oil had been got, became the great theatre of speculation; and the same wild, reckless, and foolish way of operating again characterized the oil business, and again confirmed the outside world in the opinion that oil men had bad business habits, and worse morals.

At this time Petrolia began. The high prices in 1865 led to systematic operation about Bear Creek at that point where some indications of oil had been seen. Success crowned the efforts, and another oil centre was thus formed. But Petrolia had scarcely begun to live when its growth was checked. In 1866 Canada's supply of oil was in excess of her demand, and forthwith the decline began. There was, however, a moderate amount of life in Bothwell, Oil Springs and Petrolia. The wells were small, and production did not get ahead very quickly. The Fenian raid squelched speculation for the time being, to the great disgust of those who had property to sell, and a number of these gentlemen were immediately converted to be strong annexationists, their knowledge of political economy not being deep enough to let them know that demand and supply did rule price, which is the basis of all speculation; and that although a temporary disturbance of the ordinary course of business was caused by the raid, it would not ultimately have affected the value of their property, had there not occurred about that time one of the most important events that has occurred in the crude producing business of Canada—the strike of the King flowing well, near Petrolia.

This was an epoch in the oil history of Canada. The King well flowed a number of months, yielding largely. Land round it was tapped immediately, and wells producing several hundred barrels a day became the rule. The price of oil declined. Both well and Oil Springs could no longer produce at paying rates, and the crude oil production became the monopoly of Petrolia. Anomalous as it may seem, Petrolia rose on a falling market. Oil, however, became a drug. The oil could not be exported. Many invested in it at the low rates it was to be had at, so that at the end of 1868 there were held about 400,000 barrels of crude oil in tanks, and times were very hard. Property was of low nominal value, and the prospect was anything but pleasant, when a deodorizing process was introduced by a gentleman of the name of Allen. The oil was rendered fit for export, and the dark cloud was rolled away from Petrolia forever.

The refining business consequently received an enormous stimulus. The heavy stock of tanked oil has been much reduced, and Petrolia now produces about 9,000 barrels crude per week, with quick demand.

The low prices which so long ruled for oil have led to much greater economy in well work, and Petrolia will bear favorable comparison with the U. S. operators as regards quality of machinery and class of drillers.

The great uncertainty as to the lasting of wells, and the changes from one centre of production to another, which has been the characteristic of some districts in Pennsylvania, and in Oil Springs and Bothwell, in Canada, is the chief drawback to the present prosperity of Petrolia. Nobody will do anything in the way of investments except directly for oil purposes.

Let us see if there is anything in the experience of the Pennsylvania oil regions, or of those here, which in the present state of the Canadian crude oil business—with the fact of the recent large developments close to Petrolia—that will confirm the opinion which is so very generally held, that Petrolia may in six or twelve months be a second and enlarged edition of Oil Springs; and that consequently everything should be done only for the day; and that people should live as miserably, eat as miserably, be housed as miserably, and get along in general as miserably as possible, at the highest possible prices.

Judging from the Pennsylvania regions, where wells play out quicker than here, no district has ever been permanently abandoned; and if left for a time, owing to the low price of oil, or easier production elsewhere, has always paid coming back to it. The Tarr farm and other districts can be cited in proof.

Bothwell went down as a producing district, not that it produced less, or that there were less prospects of producing, but that Petrolia produced more; and having no exports, the market was quickly glutted, so that with their comparatively small wells and high cost of well drilling, which arose from the nature of the ground and backward state of the science of drilling, compared with that now, it did not pay then to produce oil in Bothwell. But none who have operated there believe that oil has played out, and it is their firm conviction that when time and price suit, Bothwell oil will again be in the market.

The same remarks apply also to Oil Springs, with this difference, that Oil Springs at one time had large flowing wells, which of course gave out. But Oil Springs never stopped producing until Petrolia flooded the market. Developments around Oil Springs were much cramped by the want of railway communication, everything having to be teamed twelve miles, and the attention Bothwell commanded last oil fever, which, being more conveniently situated every way, was more fancied for operations. But who shall say that there is no oil in or about Oil Springs? or that the village will not again be a scene of life and activity? Ever and anon we hear of the flowing of some of the old wells, and if when the Canada Southern railway goes through, Oil Springs does not again contribute its quota to the oil production, it will prove to be against all experience of Pennsylvania operators.

What are the facts about Petrolia. In the region about Bear creek a respectable number of average wells were struck, some of which, after five years' pumping are still at work; but most were abandoned because the wells in the King territory produced so much, and prices were so low that they did not pay to work. If ever prices were approximate to those of Pennsylvania, there would be a great many small wells pumped that are now lying idle. The King territory itself has been pronounced the most wonderful oil territory in the world, considering the way the wells have lasted, many of them, after four years' pumping, producing 30 to 60 barrels a day. And yet notwithstanding the large amount of oil pumped from that territory, close by it, in 1870, after the start matters got in the beginning of 1869 had realized some solid results, prosperity had been confirmed, and some outside developments had been tried, Craise had struck his 300 barrel well, which was followed by very large developments on the McMillan, Shoemaker, and *contiguous* territories. Six months ago Fysh & Townsend redeemed the reputation of twelve in the twelfth by striking their celebrated "Ironsides;" and only a month or two ago, Penton, by a good strike, opened up another doubtful district, in which there have been a number of good strikes since, and last, but not least, Clement struck the well which has been the best strike for four years—pumping on the start 400 to 500 barrels per day—and which has also been followed by some other good strikes in the immediate vicinity. All these good strikes have been made within a mile or so of Petrolia. Development westward too has progressed; a good well is being pumped five miles west: drilling is going on all the way between Petrolia and that point, and there is a well being drilled now in the township of Sarnia.

At present the daily production is higher than ever it was before. Perhaps for a week or two during the King territory strikes it might have been more, but for a steady, continuous production, Petrolia stands higher than ever she did before; and it is kept up and on the increase, while activity is great in all departments of the oil business; and this, after six years' life, when by all the laws of oil districts, as expounded by those who cannot read the signs of the times, and the different circumstances of the oil business now from what it was five or ten years ago, Petrolia ought to have been a deserted village, and the headquarters of production somewhere in the swamps of Brooke.

Therefore oil is being produced five miles west of Petrolia, whilst oil has been found at Oil Springs and Bothwell, seven miles and eighteen miles south-east respectively; and production in the immediate vicinity of Petrolia is greater than ever, from which it may fairly be inferred that the Canadian petroleum business is only in its infancy; and that there is enormous scope for developing operations.

The number of wells pumping is over 140, and there are continually a good many in course of being put down. Petrolia's weekly income from crude petroleum is upward of $15,000, or at the rate of $800,000 per annum. The number of engines, boilers, well tools and general supplies always in demand is very large, whilst the population has nearly trebled itself during the last two years; and house accomodation is always short of the demand. Machinists, blacksmiths, boiler makers, and laborers of all sorts command the highest wages of any place in Canada. Farmers in the vicinity of Petrolia are making fortunes off the high price paid for their produce, whilst storekeepers are never to be heard grumbling, but are always satisfied with the business they do. The oil developement has been a great national gain, from the country it has opened up, and the immense stimulus it has given to many branches of industry. London owes its present prosperity to the oil business, which has changed it from a decaying to a living city. The oil refineries there, with all the industries depending on them, chemical works, cooperages, machine shops, &c., &c., have been a great boon to it; and the stimulus given to industry generally by the oil business here, has been felt directly over all the western peninsula of Ontario.

While population has trebled itself, and men have been on the high road to fortune during the last two years, the business of oil producing itself is now as systematic and economic as any business can be. Everything that can be done to save labor and power is done, and people do not strive to make money by wild speculations and all sorts of "plants" as in early days, but by trying to produce as much oil as they can at the least possible cost.

Many of the early operations failed on account of the newness of the business, and particularly those undertaken by joint stock companies, whose agents did not as a rule vindicate the trust reposed in them. It is a question if joint stock companies could work the producing business, as the amount of close attention, knowledge and energy required, which their representative must have, can be turned to far greater advantage for himself. In spite of the ups and downs of the interest, men of sound business habits who stuck to it have all pulled through without exception, and numbers of our operators here can reckon their incomes at a rate that leaves them nothing to envy the Governor General. Many, too, by hard work and good fortune have lifted themselves out of the ranks of day laborers to a position of comparative wealth with its corresponding advantages.

There is one cause still active which depreciates the the value of Canadian crude oil, and that is ignorance of the proper manufacture of heavy oil and paraffine from the residues, after the burning oil has been taken off. Canadian oil is of a different gravity from Pennsylvanian, and a much larger residuum is left after the burning is run off. The want of an export communication prevented this being worked up. Several attempts have been made to establish works for heavy oil and paraffine manufacture but without marked success, and with no effect on the price of crude; while meantime crude is being shipped to Europe at a profit, because there they worked up everything, and the residuum is being all the time shipped to the States, where they can afford to pay cost of packages, duty, &c., in addition to the price of the tar, and make a handsome profit. Crude oil here should be from 50 cents to $1 a barrel higher to-day than the export price as fixed by the present combination gives. The crude men ought to take this in hand, and encourage scientific workers of their oil to come to Canada and work it, or they could subscribe a sum to be paid to the refiner by whose action the price of oil was raised above present export in a natural way, by scientific handling of the residuums. It requires little argument to convince crude men that $1 a barrel more for the oil would be a very desirable thing.

Apart from the oil in the immediate vicinity, there is yet another source of property to which Petrolia may fairly look. Why should she remain the head centre of production, the Titusville of Ontario? Development will push its way out from Petrolia on all sides. Why should not the connection be kept, and the place remain the mart—the commercial centre? Why should not the oil be refined here as at Titusville? We see no reason why Petrolia should not yet emulate Titusville. A connection with the Great Western on the north, with pipe lines from all producing points, would go far to make it so; and if those interested in property in Petrolia give this matter their constant attention, it would conduce to the stability of the place for many years. Why should not all well tools be made here? There are many industries in connection with oil production that should have their headquarters here. Look at the advertisements in the Titusville *Herald*, and see how its business men have worked it up—sending drilling tools all over the world. And why should we not yet have our daily Petroleum *Advertiser*, instead of the weekly one? With proper attention on the part of those interested, Petrolia might be made the capital of Oildom for a long time to come.

Having experienced very hard times at the start, as usual with oil villages, the buildings erected were of a very temporary nature. The hotels were constructed on the bee-hive principle, to contain the greatest number of inhabitants in the least possible space, at the least possible expense in building. Times were when men paid $1.00 a night to lie on the floor; and if any one of them slept a little more soundly than others, if he had a blanket to begin the evening with, he found that his neighbor had it in the morning.

Houses were put up in the same way. People were going to make their pile and go out, but they cannot do it. The business has too many fascinations, so they had just as well make up their minds to be comfortable as not, and live as well as possible. It has improved vastly in this respect, but much remains yet to be done. None of the present oil operators will retire to some sweet secluded spot for quite a while yet.

This article will, we hope, show to the inhabitants of this oil district, and the outside public, the real importance of the interest, and its prospect of certain stability. It is not beyond the bounds of probability that there will be a greater daily production here one day than in Pennsylvania, as there is no district in Pennsylvania, within a given area, that produces more than we do now. If this is accomplished, the wealth that will accrue to this district will be enormous; and if any extension of enterprise, development, refining science, or manufacturing establishments, results from the publication of the facts set forth in this article, it will not have been written in vain.

"STRUCK OIL"—THE LAW OF LAWLESSNESS.

BY WILLIAM WRIGHT.

[*Written* 1865.]

At last the labor, the anxiety, the profuse expenditures of long months have been crowned with triumph. The sand-pump has brought up unmistakable evidences of the existence of petroleum, which floats upon the surface of its load of mud in long, dark streaks, most gratifying to behold. The well in question is one success, after one, two or more failures, and gives promise of paying all expenses connected with the whole number. A grand halo of wealth and beauty thenceforth rests upon every adjoining field and patch of wood, which has become in some measure *sacred*. That which was almost valueless yesterday is viewed as a princely inheritance to-day.

But here, at the outset, comes in "the law of lawlessness." For precisely as every human being has his own set of features, tone of voice, and the like, so each individual oil-well has *its* characteristics, with regard to the escape of water, gas, petroleum, or all three. In one, the flow of the last named will be continuous and uniform, day and night, not varying more from week to week than a spring-brook. It may or may not be accompanied by a large escape of gas, visible to the naked eye, though it ordinarily is by some. In such a flowing concern there is no noise, except the splash of the liquid falling into the tank. But in others, a regular periodicity takes place in the discharge. The Coquette well, for example, emits a succession of sounds as loud and sharp as the exhausts of a small steam-engine, and occurring in tolerable order every ten seconds, in such a manner as 1, 2, 3, 4; 1, 2; 1, 2, 3; 1, 2, 3, 4; sometimes two of these coming off together by an extraordinary effort. A copious discharge of gas comes off with each of these eructations, ascending from the tube like a thin smoke, to mingle with the atmosphere. The Wild-Cat well, at Petroleum Centre, and the Yankee, on Cherry Run, remain silent for forty and twenty minutes respectively; then begin to foam and spirt, the oil coming off at first only in drops, but increasing by degrees until the tube belches forth quite freely; these discharges afterward decrease in violence, and finally stop altogether, after the lapse of from five to eight minutes. Each escape of liquid is accompanied by a sharp report, which may be heard one hundred yards off or more. Those which have a continuous flow are apt to produce more abundantly. Yet this rule is not universal; for the Coquette discharged spasmodically, while a well on Cornplanter Run rather dripped than flowed one or two barrels per week.

Others again are found to remain quiescent for twenty-one or twenty-two hours in the day; then to break forth in one continuous flow, or a succession of belchings, for the other two or three hours. A few run for six hours, and then subside, or distribute their favors over twelve hours in the twenty-four. The Dunn well, on Watson flats, produced freely from morning till midday; then the supply diminished or stopped altogether, for the rest of the day, the pump bringing little but salt water. But in the case of the pumping-wells, the rule is pretty common to spirt forth from a few drops to several quarts at each revolution of the engine, varying according to the season, but not modified by day and night.

No person has yet arisen who can explain the full *rationale* of these vagaries on the part of Nature. No one cause can be assigned which will account for all the phenomena. There can be no doubt that the efforts of the imprisoned gas to escape into the upper atmosphere have much to do with forcing up the oil; yet in numerous works of the largest flow the escape of gas is comparatively small, and altogether insufficient to carry such a column of liquid up the tube. For it is needless to observe that a discharge of three thousand barrels per day would almost completely fill a two-inch tube, making in it a nearly unbroken column for the height of five hundred to one thousand feet. Would the comparatively small body of gas escaping therewith be sufficient to force upward such a load, exerting a pressure that is practically unknown in hydraulics?

In the cases of spasmodic wells, the gas may have a great deal to do with bringing petroleum upward—in many, there can be no earthly doubt on the subject. In the case of the Dunn well, the superintendent conducted an experiment that proved this point satisfactorily. They had been using a portion of its gas in the furnace to generate heat, but on turning it *all* on the fire, the discharge of oil and water stopped instantly. After a few minutes, the gas was partly permitted to escape as before, when the yield began to return to its former amount. In plain English, the energy of the gas coming up the tube was insufficient to do its work, and bear the additional pressure upon it necessary to its confinement with a view to use. While on this subject, I may mention another curious experiment made by the same manager (Mr. Morrell), who conducted this gas through paper surrounded by *ice*. The result was that the gas was converted into a white, wax-like substance, which settled on the paper, and is supposed to have been paraffine.

Nor will the theory that the oil and briny veins are supplied from springs higher up in the hills, suffice to account for the phenomenon. For, in the first place, there is no evidence that such elevated sources exist close by in quantities sufficient to feed such wells as the Philips (flowing nearly one thousand barrels daily for a considerable period), *and force it up to the surface.* The origin of most of our water-springs is easily accounted for by percolation through the under-strata from higher levels; but in the case of Artesian wells, constructed on such interminable plains as those of Texas, this theory proves insufficient to account for the outburst which has followed. Whatever the agency or mode of operating on Nature's part there, in my judgment, the like has been at work in forcing up much of the rock-oil.

Even if, as in nine cases out of ten with productive wells at first, and in all ultimately, an application of the pump be required, the same lawlessness is found to prevail as does in the flowing wells. The first revolution of the engine may bring up petroleum or salt water of any imaginable degree of strength. Nay, in a few instances, *fresh* water has come up with the former. One of these was near the famous Sherman well, where the two liquids had to be separated by artificial means. The case of the Sherwood and Kelly well, on Cherry Run, which threw up three thousand barrels a day of fresh water to the height of sixty feet, flinging out fragments of rock several pounds in weight, is not so remarkable, as this vein was struck at the depth of seventy feet, and may have been fed by the hills above. There was no oil with that water, and I refer to the circumstances to show one of the obstacles that must occasionally be encountered by operators.

It may require days or weeks to exhaust the heavy liquid (brine) before the lighter comes within reach of the pump. In one instance the proprietor having got the impression that oil certainly existed, kept on pumping for *six weeks* before his efforts were rewarded with success. The best well (Ingersoll) now in operation in the Watson flats was incorrigible until nearly the whole winter months had been exhausted in forcing up the salt water; at last, it also yielded to perseverance, emitting a stream of from forty to fifty barrels daily. There is every reason to believe that hundreds of works have been abandoned by those in charge of them, because, after pumping a few hours, the petroleum did not make its appearance; yet the perseverance which wrenches victory out of defeat might have made them productive. For it is one thing to be flooded with salt water at the outset, before oil has been reached, and another to keep on pumping a well which has gradually declined from a high figure to nothing, in spite of re-tubing and all the other known appliances.

And why, except from a disposition on the part of Dame Nature to indulge in freaks, should water be found floating on the surface of oil, the latter being the less ponderable of the two; while gas, coming up with it, is *im*ponderable? Various explanations have been offered; yet none, in my opinion, that will account for the regularity of this phenomenon. It has been supposed that, in consequence of carrying the lower end of the tubing below the level of the petroleum, the latter cannot enter the orifice until the former, lying beneath it, has been expelled. This crude theory is confuted by universal experience; for it surely could not help happening sometimes that the tube would be so conveniently short as not to pass beyond the petroleum. Besides, if substances arranged themselves in the well according to their specific gravity, would not the gas make its appearance first, instead of its awaiting the removal of the water, and then assisting to expel the more valuable liquid? Once more, the sand-pump shows that, in numerous instances at least, the salt veins are reached in boring rather earlier than the oil veins; though I concede that the testimony on this point is anything but explicit or uniform. But it occurs often enough to refute the notion that the oil actually reaches the top in the wells and settles there.

Another explanation has been offered, namely, that a vein or veins may be struck at a point below the general level, where they are fed from reservoirs somewhat higher up; hence that, inasmuch as the brine would settle to the bottom in the natural crevices, it must be pumped out prior to the oil and gas being able to come downward and forward. Further, that it is by tapping the source at the *right* place that such immensely productive works as the Philips, the Noble, the Sherman, and the Coquette have begun to produce at once such prodigious quantities of oil, and that almost entirely free from water. This theory is much more satisfactory than the former; yet it will not suffice to explain the regularity—almost uniformity—of brine being found first in order. If, in the multitudes of experiments made, petroleum came first as often as does the salt water, it would not be necessary to look further. Unfortunately for it, such is not the case. It does not appear reasonable that the lower reservoir should be almost invariably struck by borers, and the upper scarcely ever. Some other solution of the difficulty must be sought to cover this unexpected regularity in the heaviest substance coming up first—one which will apply to the ninety-nine cases as well as the hundredth. Elsewhere I have alluded to Mr. Morrell's experiment of separating oil and water in the atmospheric pump; though whether this will apply when a quantity of gas is mixed with the liquids, I am not advised.

And whence the salt, that in the form of brine, gushes upward from depths of one hundred or one thousand feet? Those who entertain the theory that petroleum has been distilled from the upland coal-beds which once existed along the present oil-basin—the products percolating through the different strata to their present depths—account for the existence of salt-springs by the fresh water filtering downward mixing with muriate of soda in sufficient quantity to form the brine. But to account satisfactorily for depositing in the rocks the quantity of muriatic acid necessary for this purpose, is every whit as difficult as to answer the original question. It has been only removed one stage further off. The salt water has its position in the scale, as has the fresh water its assigned position or limit. Above the first sand-rock, the water is invariably fresh; between the first and the second, it is expected to be such; below that stratum, it is as certainly expected to be brackish or briny, the degree probably depending on the proportion of fresh water let down the orifice, while the work of drilling has gone on. As a rule, the surface water does not go down through the second rock, or the brine force itself above it, until an artificial opening exists, the exceptions being so few in either case as to establish the general principle here laid down. Besides we all know that water, in passing through sand or clay, is apt rather to part with impurities than take others up.

The only satisfactory explanation of the existence of so many salt springs is, that the strata in which they abound, at one period in the world's history, formed part of the ocean-bed. This may have consisted of limestones, sandstones, or conglomerates, all saturated with brine, and reposing on what had been beds of clay which contained carbonaceous ingredients; while the process of baking this clay into shales filled it with cracks and seams, that have since become so many veins, filled with salt water or petroleum expressed from the rocks subsequently formed; the whole being upheaved to their present elevations. But who shall fill up the picture of those ages, of which this is scarcely an outline?

The relationship between brine and petroleum is intimate, yet they are not invariably found close together. Where oil is got in the second sand-rock, it has sometimes happened that the "show" of salt water was scarcely perceptible in or above the oil vein. By sinking a few feet deeper, however, the brine would flow up so profusely as to completely monopolize the tube and choke off the more desirable product. An instance of this happened in Franklin, involving the immediate ruin of a profitable well. Another disaster of the same kind, close by, was only prevented by forcing down a plug, which stopped any further uprising of the salt water. But as a rule, the two are found in such close contiguity that it is difficult to decide which has been sooner reached. At Tidioute, the alliance is so intimate that it has come to be considered a maxim: "No salt, no oil." As to the why or wherefore of this connection, our superficial philosophy must place its finger on the lip, and be modestly silent—for the present.

Nor does the law of lawlessness end here. As men have been accustomed to measure the decreasing temperature, in ascending from the sea-level, so have they measured its increase downward, as found in mines, caverns, and the like. This increase is about one degree Fahrenheit for every sixty feet. At this rate, we should find the oil, water, gas, etc., brought up from a depth of six hundred feet, to be (say) ten degrees hotter than are ordinarily found on the surface. My attention was first called to the contrary by the superintendent of the Cherry Valley Oil Company, who observed that from the Yankee well oil flowed very little above the freezing point. In some few instances, whether owing to careless observations or Nature's freakishness, his remarks were not borne out by other operators, but in many more they were fully confirmed. Mr. Ostrom, of Titusville, who has been some years at work in the valley, took the pains to test the matter by the themometer. He observes that different wells range through various degrees of temperature, according to the season. *In winter this is not apt to be so low as in summer*, when it is usually found as far down as forty or forty-five degrees; at the opposite season it rises, in some wells, up to sixty degrees, causing a smoke to ascend from the surface of the tank. The tests in all cases were made in a pailful of liquid, as discharged from the pipe, in which the heat and cold would both be somewhat modified. The whole subject requires much more extended observations than have yet been given to it, previous to making which it is not advisable to theorize respecting the causes at work in producing this effect. The circumstance shows, however, that men who have undertaken to calculate at what distance from the surface our globe is in a liquid state, have reckoned altogether too fast.

Indeed, as if with a design to nullify theories or teachings of any kind as to the subterranean world, and absolutely to bewilder the investigator, rendering him hopeless of arriving at any general conclusions, we have the fact vouched for by multitudes of experienced operators, that *wells yield much less freely in winter than in the summer season.* This assertion is also called in question by some practical men, who seem to be as diverse in their relating matters of fact, as Nature is erratic in carrying on her processes. Thus, an intelligent superintendent at Petroleum Centre admits the fact of a difference to a slight extent, but denies that it should be attributed to the cause assigned, namely, the agency of or sympathy with conditions existing in our upper atmosphere. His belief is, that the collection of paraffine in the tubes, which is much greater during cold than hot weather, and prevents the free passage of oil, water and gas, creates all the difficulty. As proof of this theory, he alleges that the paraffine collects on that part of the tube which is near the surface and thus exposed to the atmosphere. Elsewhere I was assured that they had "tested" this explanation by re-tubing in winter; but invariably they found the same decrease at that season. They pointed also to the Noble, the Fountain and other flowing wells, which suspended action altogether in winter; while the pumping-wells on whole farms had been found so unprofitable then that their managers either stopped altogether, or kept on to prevent the supply of petroleum from stopping for all time. Some managers report a difference of thirty per cent. between the average production of wells in summer and winter. The superintendent of the Briggs Oil Company declares that he can predict changes in the weather for twenty-four hours in advance by observing the yield of his wells. On the approach of a cold rain or snow-storm, they begin to slacken up a full day beforehand. On the other hand, after commencing to yield more freely, it is safe to calculate upon pleasant weather. No better barometer, he alleges, could be devised to forecast the outbreak of storms than the decreased production of these long tubes, with petroleum instead of mercury. He thinks these are changes wrought by heat and cold, not the mere presence or absence of a certain quantity of moisture in the atmosphere. The Forest City well did not yield twenty-five barrels of oil per day during the dead winter of 1863–4, but recovered to an average of eighty-five barrels next summer. In December last it gave out altogether, and so continued till the eighth of March, when oil once more made its appearance, but in small quantities at first.

Testimony to the same effect is so abundant, that it cannot be upset by the experience, much less by the *opinion*, of a few individuals, no matter how trustworthy as observers and narrators. But the difference between summer and winter production is doubtless not so great in new as in old wells, or in flowing as in pumping ones. It is in that stage of decay, approaching exhaustion, where the gas coöperates less vigorously with the pump, that the greatest diversity as to season is found. But how or why such intimate sympathy should exist, when every means is used to exclude air from reaching the fountains, or gas from passing upward, except through the tubes, I do not pretend to be able to explain.

Perhaps one or two other observations may assist the reader in arriving at a better understanding of the subject. The localities where this ærial sympathy is most acutely felt, contain large numbers of old and idle wells. In those which have been sunk on ground least punctured by the drill, I believe there is the least cause for complaint. Still, at the Economy wells, Tidioute, where the land has been little bored on that side of the river, there is an acknowledged difference of the summer season. The veins supplying those wells have certainly not been reached by others within the distance of half a mile.

Mr. Fox, manager of the large interest owning Petroleum Centre, observes that sometimes wells flow pure water, then oil alone, then water only. In that locality, he believes the oil and water are got together below the third sand-rock.

Even with regard to the veins of petroleum, such a degree of uncertainty exists, in advance of actual trial, that they may be justly placed among the objects or phenomena subject to the law of lawlessness. Before sinking a well, it is utterly impossible to foresee whether it will or will not strike the oil-vein that feeds a neighboring well, Scores of instances might be brought forward to prove that a constant and intimate sympathy below ground *does* exist between wells situated hundreds of yards apart. On the celebrated Tarr farm, several weeks were consumed last spring in pumping out the water which had collected from above, in consequence of withdrawing the tubes and leaving the orifices open. This water passed from one well to another, flooding those on the whole farm. The same costly process has to be gone through with the present season, many, at the time of my visit, having just begun to discharge the bilge-water, which had been collecting during the winter months, The great Philips spring was reached by a rival interest, which carried off two thousand barrels a day, and nearly dried up the original source. By withdrawing the tubes, each manager found he could render the other work utterly unproductive. Finally, after much litigation and delay, the difficulty was settled by each proprietor agreeing to give the other one-third of his own yield, on condition of the other keeping his tubes in proper order. In one case, this connection was so intimate, through subterranean channels, that the sounds made in drilling one, though not audible at its mouth, could be heard coming up the next well. On the Watson flats, a torpedo, let down nearly five hundred feet into an exhausted well, exploded and started the oil in another, though nearly half a mile distant, improving the character of the one subjected to the operation.

On the other hand, Mr. Duncan, an experienced operator, assured me that one of his wells, which had been sunk close by the boundary-line of his lot, yielded so largely as to excite the cupidity of a neighbor. The latter decided to bore at a point within eleven feet of Mr. D.'s well. After sinking some distance, an offer to pay all expenses then incurred, on condition of abandoning the attempt, was promptly rejected. The work was carried down to a point below the Duncan well, but it yielded nothing. Not disheartened at this failure, the intruder made a second attempt at tapping the spring, going a few feet further off in a somewhat different direction; the result was a yield of about one barrel per day for a time, which led him to abandon the enterprise. Many other instances of the same sort might be adduced, showing that the notion entertained by some of a grand reservoir of oil lying below ground at a given depth, is unsupported by facts. Even a well sunk in a direct line between two producing works does not invariably strike the common vein; for though passing within a few inches of the spot, a bed of clay or solid rock may forbid the exit of petroleum.

"Surface indications," it has been shown, relate simply to the oil-springs found in the upper sand-rock, and these are commonly so insignificant that operators pay little attention to them. To reach the more abundant sources in the inferior rocks there is no certain guide, the only approach to such being to get as nearly as possible on a direct line between other producing wells. The law of lawlessness also applies to *the quantity* of oil which a spring will yield after being reached, as truly as to its prospects in advance. Two wells may be within fifty feet of each other, as closely as they can be operated to advantage; yet, while one pours forth a hundred barrels per day, the other will refuse to give out more than ten. Even their modes of contributing these quotas will vary, one flowing by fits and starts, the other emitting a steady stream in response to the pump. The one may run two years, while the other becomes exhausted perhaps at the end of three months or thirty days. Commonly, the contrast is not so sharp as this, wells on the same vein having a good degree of sympathy with each other; yet the purchaser ought to make the possibility of an entire diversity in time as truly as in yield, enter into his calculation as to productiveness.

In no other respect does the apparent capriciousness of Nature manifest itself more clearly than in the duration of an oil-spring. *The fact that wells would give out at last* was unknown, until it had been proved by abundant and most painful evidences. It is still called in question by some, who are either ignorant of the country or interested in creating misconceptions in the public mind. After so large a proportion of the works have gone through the several stages of flowing, pumping, deepening, re-reaming, etc., and then refused to contribute enough to pay expenses, it is unpardonable for persons at the East to be caught napping, either by investing their means in defunct concerns or expecting productive ones to last forever. The excuses which a stranger is apt to hear or observe in print as to the number of idle derricks, are endless, and ought to arouse suspicion at once. "Oh! she was damaged by the flood;" as if a very profitable enterprise would be even temporarily abandoned for the lack of a few thousand dollars, which could be repaid within as many weeks. "She was never put down deep enough;" as if the apologist had been in the basement story, and examined how much further it was to the great petroleum reservoir. "She was abandoned in 1861, when oil had sunk in price to twenty-five cents a barrel, and has never been worked since;" as if crude petroleum had not since advanced to half as many dollars per barrel at the well. "Her lease has expired, and she is now in the hands of the original owners of the land;" as if they or thousands of others would not have rushed to the rescue of a productive concern, which was going to ruin for want of a little means. Rarely, indeed, are these excuses more than founded on fact, the truth in almost all cases being, that the wells have gone dry or were unproductive at first. The chances are believed to be quite as many in favor of sinking a new well as of deepening an old one, even though it may not have reached a greater depth than three hundred feet in the first instance.

Of those which were bored as early as 1861, I think it safe to estimate that not more than one in a hundred have continued to yield steadily ever since, and are now affording enough to pay operating expenses. The Economy wells, at Tidioute, are most remarkable exceptions in this respect. The fact that that spring should have been reached within one hundred and fifty feet of the surface, makes the "record" of those works the more interesting. Certainly the whole region of Petrolia has no parallel cases to these; and at this moment I do not recall a solitary instance where a well, no matter to what depth sunk, has continued to flow or pump, without serious interruption, for four years, as they have done. Let no lucky adventurer who may strike oil lay the flattering unction to his soul that the spring which foams and bleeds so profusely in his presence will continue to pour forth oil in paying quantities for four, three, or perhaps even two years. Before the end of eighteen months, it will not only call frequently for repairs and renewals, but probably have settled down to figures so modest as barely to cover working expenses. An oil-spring insurance company, did such exist, would not issue a policy, upon the first discharge of a well, that it would hold out longer than twelve months; at any rate, it would be unsafe to accept the risk of its continuing to yield more than ten per cent. of the average of its first month's production. Indeed, experts have assured me that they have set down *nine* months as the ordinary period of gestation; so that what additional contributions may be made are such as the lucky possessor has no right to expect.

Although we do not hold ourselves responsible for all opinions therein set forth, we give place with pleasure to the foregoing paper, from the fact that it contains many and varied valuable thoughts, which may be of service to the scientific observer, in furnishing such with data to aid them in their investigations in relation to the geology of the oil regions

DRILLERS' RECORD OF AN ARTESIAN WELL AT TERRE HAUTE, INDIANA.

THE following is the record of the boring of the White Sulphur Artesian Well at Terre Haute in Indiana. There are three wells at Terre Haute, respectively 1,925, 1,635 and 1,785 feet deep. The second one mentioned was stopped before reaching sulphur water. The first and second are 4⅝ inch holes. The one recorded below has a drive pipe, 6 inches inside, to rock, 130 feet down. Ash poles 2 inch diameter and 15 to 18 feet long were used (37 feet long in the 1,635 feet well). Well tubed to the bottom; cased with 3¼ inch casing to 600 feet; seed bag on the casing; works well; had difficulty in the 1,925 well because not cased; engine about 18 horse power; wooden sucker rods 18 feet long. The 1,635 feet well is pumped; the other two flow slowly.

Record: at 840 feet a show of oil; at 1,276, *nine inch vein, lubricating oil;* at 1,335, vein of fresh water; at 1,629, 10 *inch vein of oil;* at 1,658, blue sulphur water; at 1,710, white sulphur water; at 1,768 white sulphur water; at 1,785, large flow of white sulphur water, rising at the rate of about 6,000 gallons per hour. Sand and gravel were passed through for the first

were passed through for the first	150	feet.
Fire clay, 1½; brown slate, 2; soapstone, 11; *coal,* 4	168½	"
Fire clay, 3½; limestone, 2 feet 1 inch; fire clay, 3 feet 2 inches; brown limestone, 2; soapstone, 1½; *coal,* 6	181¼	"
Fire clay, 3 feet 2 inches; (salt water); blue limestone, 2½; hard pan, 8½; soapstone, 10 feet 5 inches; *coal,* 2	207¾	"
Fire clay 3,; sandstone, 1; blue limestone, 2 feet four inches; dark blue rock, 2¼; white sandstone 3; fire clay, 5; shale, 2 feet four inches; soapstone 2; blue limestone, 5 feet 2 inches; soapstone, 5; *black shale,* 4; blue sandstone, 6; *black shale,* 2	251	"
Fire clay, 5; gray sandstone, 10; *coal,* 0 feet 9 inches	267	"
Fire clay, 2 feet 5 inches; blue rock, 3 feet 4 inches; *black shale,* 3	276	"
Fire clay, 2 feet 3 inches; limestone 4; fire clay, 5 feet 10 inches; limestone, 3 feet 6 inches: *coal,* 2½	293¾	"
Fire clay, 1; sandstone, 28 feet 3 inches; fire clay, 7 feet 2 inches; blue sandstone, 27; slate, 9; blue sandstone, 29 feet 1 inch; white sandstone, 8; slate 36 feet 2½ inches; sandstone, 1 foot 7½ inches; blue slate, 15 feet 9 inches; white slate, 10 feet 2 inches; (salt water) white sandstone, 35 feet 11½ inches; soapstone, 43; blue slate, 28 feet 7½ inches; white slate, 7 feet 7 inches; hard sandstone, 23 feet 9 inches; hard black stone, 9 feet 6 inches: white slate, 12; (salt water and gas); hard sand rock, 127 feet ½ inch	746½	"
Limestone white, 4 feet 4 inches; fire clay, 3 feet 3 inches; white limestone, 30; hard gray sandstone, 10; blue limestone, 6 feet 11 inches	801¼	"

Sandstone, hard white, 0 feet 9 inches; hard blue sandstone, 3 feet 6 inches; blue clay, 3; hard gray sandstone, 2 feet 3½ inches; hard blue limestone, 3 feet 3 inches; hard sandstone, 110 feet 5 inches; soft sandstone, 7 feet 3 inches; blue slate, 5; blue hard sandstone, 411 feet 2 inches; blue soapstone, 34 feet 10 inches; white grit sandstone, 117 feet 2 inches; hard blue slate, 48; brown sandstone, 89 feet 11 inches; white coarse sandstone, 10 feet 9 inches; dark sandstone, 6 feet 9 inches; yellow sandstone, 44 feet 2 inches; hard flint, 15 feet 8 inches; clay, limestone or shale, 70 feet 2 inches....................................1,785 feet.

LUBRICATORS—SPECIFIC GRAVITY.

THE different standard lubricating oils, when measured by Beaume's scale at a temperature of 60° Fahrenheit, range from 22° to 36° specific gravity, or weigh from seven pounds twelve ounces, to seven pounds to the gallon. The specific gravity, or weight of an oil does not necessarily indicate its quality or value as a lubricator. It is important in determining the relative value of different oils of the same class, or kind. Of these the heavier grades are always the best for ordinary purposes. The question of gravity is of little account, however, in comparing any particular class of oil with others of a different class, for the reason that their nature and characteristics may be entirely different, and a light oil of one class be greatly superior in lubricating qualities to a much heavier oil of another class. As between these, quality and adaptation must be the controlling considerations. Formerly the gravity of oils was regarded as of much greater importance than it is now. The fish and animal oils were all of heavy gravity, and it was found difficult to convince consumers that a lighter oil might be equally as well, if not better adapted to many of their uses. Even after the wonderful lubricating qualities of the hydro-carbons had been fully established, it took a long time to overcome the existing prejudice and bring them into general use.

Different qualities are required in lubricators according to the different uses to which they are to be applied, and it is always important to select such as are adapted to the work to be done. In the case of slow, heavy bearings, or any heavy machinery where the bearing surfaces work under great pressure, a heavy sluggish oil is required, while for light and rapid motion a lighter oil should be used. Then there is a difference in the kinds of material composing the working surfaces.

These range from wood and coarse wrought and cast iron to the finest brass and steel, and very often all of these are found in the same machinery. A knowledge of these ever varying conditions, as well as of the nature and quality of oils, is necessary to secure the highest results of lubrication. The gravity of lubricators is also affected to some extent by the temperature under which the machinery works; and when used on exposed surfaces, such as railroad axles, &c., should always be a little heavier in summer than in the winter. We think this is a point of some importance to oil consumers, and in England, where the changes of temperature are less than they are here, it is very generally regarded.

We were forcibly impressed with the importance of care and intelligence in the selection of lubricants, by a conversation we recently had with the superintendent of one of the largest cotton mills in the city of Lowell, Mass. He stated that by using a light lubricating oil of about 32° gravity, composed of petroleum and a small per cent. of fish oil, they were now running the same machinery, and doing the same work with five water wheels that formerly, while using a heavier oil for lubrication, required six wheels. The oil previously used was a good article of the kind, but a series of carefully conducted experiments demonstrated that it was not adapted to the purpose for which it was used, and also indicated the kind of oil which was needed for the work. Hence the change of lubricators and a saving of some thousands of dollars, in the cost of power. It is more than possible, that by a little intelligent discrimination in the choice of oils, similar results might be attained in many other cases. We think it may safely be adopted as a maxim, that the lighter the oil—provided it has just sufficient body and viscidity to keep up lubrication, the more satisfactory will be the result.—*National Oil Journal.*

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TESTING PETROLEUM.

"PROF. VANDER WEYDE'S new test for the adulterations of kerosene seems to be of immediate practical value. This test for petroleum is founded on the fact that all vapors given off by petroleum are combustible, and that if any kerosene or other preparation from petroleum gives off a vapor at the accepted standard temperature of 110°, it is not necessary to try whether it will burn, but sufficient to collect it into a proper vessel, by which we gain the additional advantage that we may measure the quantity of the vapor, while none of it can be lost by air currents incidentally passing over the surface of the liquid. He takes, therefore, a glass tube, closed at one end and open at the other, and fills it with the petroleum to be tested, then closing the open end with the finger, inverts it in a vessel with water warmed at 110° by mixing hot and cold water, and keeping it at that temperature by occasionally adding hot water. If now any vapor is apparent, it will collect in the closed upper part of the tube, displacing the oil downward. The amount of this gas will be a comparative test of the different quantities of oil, and for this purpose the tube may be graduated in order to measure the amount of valuable liquid present in the same. This method is not subject to the discrepancies found in the usual way of testing, in which an impure and dangerous quality of oil may be made to appear better than it is by slow and gradual heating, and which, if performed in a slight draft of air, will have the vapors carried off as soon as developed, so that it becomes impossible to ignite them. This new method gives freedom from the danger of using fire, more accuracy, a trustworthy means of measurement, and no chance for deception.

This method of testing oil would certainly show the exact temperature at which any sample of oil would begin to vaporize, or, in other words, the flashing point of the oil, but it would not determine the temperature at which it would ignite, which, in reality, is the fire test of refined oil. Oil which stands one hundred and ten degrees of fire test, will begin to vaporize at a much lower temperature. The reason for this is plain. The vapor at first is given off so slowly that it has not opportunity to mix in the proper proportion with the atmospheric air to admit of ignition, and the benzine being mixed throughout the oil, has not yet had imparted to it a sufficient degree of heat to enable it to rise to the surface in a volume capable of igniting the whole mass. It therefore merely flashes. If all oil which flashed at 90 degrees would stand 110 fire test, this new method might, with some degree of accuracy, determine the fire test by the point of vaporization, but there is very great discrepancy in different samples of oil in this respect. One sample which ignites at 110 degrees will begin to vaporize at 90 degrees, and another will not flash at all until the point of ignition is reached; and this is precisely the reason why the new test would prove unsatisfactory.

Some oils are mixed mechanically. The one being lighter in gravity, and containing more benzine than the other, will form a strata on the top, while the heavier oil rests on the bottom of the vessel containing t. Let samples be taken from this vessel at various times, and the fire test will vary in proportion to the amounts of heavy and light oils contained in the samples, it being almost an impossibility to draw two samples which will stand the same test. Some of the oil might stand 110 fire test, but nearly all of it will begin to vaporize much below that point. The government has very wisely made the igniting point of oil at 110 degrees the legal test, because oil which will only flash and not ignite at lower temperatures cannot be considered dangerous. The present method of testing oil has its disadvantages, and is very objectionable in many respects. In England, the scientific world have been greatly exercised for the past few months in an endeavor to improve upon it, and have quite lately adopted the closed vessel system of testing, which they suppose to be more accurate. We used this system years ago, and finally abandoned it as increasing rather than diminishing the difficulty. Oil is a slow conductor of caloric, and while being heated is of different temperatures all the way through the mass. It is also exceedingly fickle where several samples of refined oil of different gravities are mechanically mixed. The apparatus used for testing is also subject to vary from changes in the atmosphere, a damp and a dry day giving altogether different results. The least draft of air passing through the room, or near the vaporizing cup, will vary the test according to the strength of the draft. It not infrequently happens, therefore, that oil which passes the inspector's hands at the refinery, will be rejected by another inspector after being shipped to a distance, which is a great source of annoyance and expense. It is altogether probable that some new and more accurate method may yet be devised which will answer every requirement.

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THE PROSPECTS OF THE PETROLEUM TRADE.

THE business of producing oil is at all times subject to frequent fluctuations. At times we have a period of general depression, and again, a period of advancing prices, with the consequent decrease or increase of the number of wells being put down, which is always regulated by the general state of the market. Hitherto the great reductions which have taken place in the value of petroleum, have been occasioned by a large production, by which the *bears* were afforded an opportunity of manipulating the market to suit their speculative plans. Happily this state of affairs has passed away, consequent upon the extended use of petroleum throughout the world. It is estimated that the demand at the present time, for home and foreign consumption, is equal to 21,000 barrels, crude, a production which we cannot by any means reach, unless by the discovery of some new large producing field. Altogether the prospects of the trade are bright, and we may even expect better prices at no distant date.

Ocean freights seem to be an important item to the continent prosperity of the trade, and when we consider that this branch of the carrying trade is confined to foreign ships, it strikes us that even a few American ships might be used in this branch of traffic with benefit to the petroleum interests, yet we have no desire to see the trade transferred entirely to our own bottoms, as we like competition, and fear we would by-and-by cry out in, the language of a certain great man, "save me from my friends."

EDITORIAL NOTES AND REVIEWS.

A Few Words.—With this number we reach the first anniversary of the PETROLEUM MONTHLY.

We announce this with a degree of satisfaction, for two reasons: *First*, Because the fact of our living one year will quiet the apprehensions of those kind friends who subscribed and paid simply to encourage the project, but under the protest that we would bankrupt within the year and rob them of their three dollars. *Second*, Because those others who subscribed and *didn't* pay, through fear of the failure of the concern, will now, that all fear in that direction is removed, favor us by an early settlement of all balances.

We believe we have discharged our various duties as journalists, and given to our patrons the worth of the money they have paid or promised.

During the second year we shall follow a somewhat different plan of campaign from that of the year now closed.

It is not the province of the PETROLEUM MONTHLY to record the current events of the times. This is faithfully performed by as efficient news journals as even the magnitude of the oil trade demands. We aim to collect in a neat and compact form such original or selected matter as those interested in petroleum wish *to preserve* for information or for reference. Therefore we are not confined to dates of issue so closely as other journals. We shall give the reports of production, &c., each month, and for the future *all* the reports—or synopses of all—published, until we shall have completed the arrangements now making for a compilation of statistics expressly for our MONTHLY. The reports are not compiled, or cannot be ready for the press until near the middle of each month, and this gives but little time to print, bind and distribute our books. This we deem sufficient reason for the change we make.

No. 13 of the PETROLEUM MONTHLY will, therefore, be the *January* number, 1872.

It will be issued in *December* and will contain the *November* reports.

This will leave an interval of a month in which no number will be issued; and during that month we will be busy preparing for the issue of a better magazine than that of the year now ended.

To those who have been receiving the MONTHLY since June, without ordering the same, we would say: Your names have been handed us by friends with the request that we send you specimen copies. We did so accordingly, and hope you are pleased with our efforts to publish a readable work. Should you wish to subscribe, we will date your subscription from January, 1872, thus giving in reality seventeen numbers for three dollars, our regular yearly rate.

As we also enlarge the MONTHLY with our next issue, we expect that all who have not paid their subscriptions, will do so at once. Each individual amount is small, but the aggregate is respectable, and we hope to enjoy it with our other respectability.

Three dollars is a sum so small, that in very many cases we know it escapes the memory of those who, engrossed with business cares, are only reminded of it by the monthly advent of the unpaid-for article itself.

We have tried to get a discount on postage stamps by taking a large lot, and writing to each delinquent an affectionate reminder of our peculiar relations. We failed to get the discount, owing to the fact that our postmaster has a monopoly of the stamp trade here. We, therefore, conclude to give a list of those who have forgotten us, in our next issue. We hope none will be offended, for we are sure no offense is meant. We regard it as a purely business transaction, and think it will be received as such.

The Petroleum Trade at Hamburg in 1870.—The valuable official tables of the trade of Hamburg, annually compiled with the most indefatigable industry and exactitude by the statistical department of the Board of Trade in that city, have just appeared for 1870, and show that the effects of the blockade of the Elbe and the war with France were not nearly so serious as at first apprehended.

The total quantity of petroleum imported during the year was 533,-191. Centners of refined (value 7,558,440, marks bauco), 1686 do. of crude (value 22,500, m. bco.)

3391 do.) of naphtha (value 27,070 m. bco. and 885, do. of lubricating oil (value 17,190 m. bco.) giving a total value of 7,625,200 m. bco.

Commercial Honor in the Oil Region.—The men of this region have ever been noted for their commercial honor. It has passed into a proverb—"honor of oil." But as we are regarded as anything but honest outside our producing districts, the following from the N. Y. *Globe* is no mean compliment:

"It is a noticeable fact that the spirit of the saying, 'his word is as good as his bond,' is as nearly lived up to in the oil region as in any other section of this country. 'Commercial honor' runs high there, thousands of dollars' worth of obligations being entered into and lent implicitly every day, without a written bond passing between the parties to the bargain. The celerity with which property thus passes from man to man with the aid of memorandum books alone, is, indeed, one of the most striking of the many striking features of the oil regions."

The Belt in Canada.—The great question in this region is, "How can we get leases on the belt?"

We wish to say that while we endorse the *Angell Belt*, we do not by any means say that it is the only belt of the oil regions of Pennsylvania. There are many similar distributions of oil-bearing sand-rock. We have *coal, iron, and copper* belts, and it is yet to be disproved that we have not *oil* belts. A correspondent of the *Petrolia Advertiser*, Ontario, Canada, has contributed the following, with regard to the theory in that region:

"A good deal has been said, of late, in Pennsylvania, about what is called the Oil Belt theory of Messrs. Angell & Avery. It is asserted that it has been established to the satisfaction of a number of operators, that a strip of thirty rods wide and about twenty-five miles long is sure to yield oil in paying quantities in almost every well put down, of which there are a large number.

"Here in Canada we can take out maps, and starting at the northwest corner from near Mandaumin, we have oil wells extending to Petrolia, and we continue along to Oil Springs, and then pass over to Bothwell, all nearly in a direct line to the shore of Lake Erie, from opposite that of Lake Huron. Again, the Pennsylvania Oil Region lays the other side of the lake in nearly a south-east direction. There certainly is something worthy of remark in this peculiar direction of the oil development. Neither at this point, Oil Springs, nor even at Bothwell, has oil been found in paying quantities any great distance apart, perhaps not out of a direct line over a mile, notwithstanding numerous wells have been put down beyond that distance. I do not wish to assert that we have an oil belt in Canada, but would merely raise the question, for the present, and at a future time purpose dwelling upon the subject: Is there a continuous run of oil, as a connection between the oil territory of Petrolia, Oil Springs, Bothwell, &c.? Here we have a subject worthy of the calm reflection of oil men."

Petroleum Stocks in Europe.—"To those who believe that prosperity results to producers and refiners from high prices rather than from low ones, it will be a matter of much satisfaction to learn that the enormous quantity of 149,000 barrels—or 6,705,000 gallons—of refined oil, has within the past three weeks alone, withdrawn from the seaport towns to the interior markets of Europe. This fact has not previously been published in either Europe or this country; and taken in connection with the other fact that the long-continued high rates on ocean freights have prevented the forwarding of the usual amount of stock, will be likely, so soon as generally known, to alter the tendency our markets have shown for the last quarter of a year."—*New York Bulletin.*

The *Bulletin* might add that it is an immutable law of commerce that an increased demand *must* follow an exhausted supply; and that as the uses of petroleum are being constantly extending, its consumption steadily increasing, and the production at a stand still, that "alterations of downward market tendencies" will not depend upon the bit of news concerning "Stocks in Europe"—"given for the first time" above.

SAND PUMPINGS.

Burning Well in Kentucky.—Some six miles east of Crab Orchard, in Lincoln county, Ky., there is a spring known as the "Burning Well," situated at the very base of the Cumberland mountains, and on the banks of a small stream called Dix river. The water in this well is in a constant state of ebullition, and regularly, every day, between four and five o'clock in the afternoon, overflows. A large quantity of gas is liberated, said to be carburetted hydrogen gas, to which a light being applied a flame, sometimes ten or fifteen feet in height, results. The only peculiar feature of this well is the diurnal and infallibly regular overflow, as there are several "burning wells," so called, in that and other States. The water has a strong saline taste, but, singularly enough, even after the surface has been seemingly on fire for half an hour or more, it is as cold as before the overflow.

Oil in McKean County.—We hear daily of new strikes and oil development in new and unexpected localities, and every season the oil belt, running north-east and south-west, is extended further and further in these directions. Within a few years the Alleghany region below Franklin has been opened up with the most encouraging results. New oil towns, Brady's Bend, Parker's Landing, etc., have sprang into existence, and St. Lawrence and Clarion counties have taken rank with Venango and Crawford. But there are not wanting pioneers in the opposite direction, and recent events have directed the attention of capitalists and operators in McKean county. Bradford, in McKean county, which lies about fifty miles north-east from the Tidioute and Triumph tracts, is at present the scene of a good deal of oil excitement. Bradford is about twelve hours' ride from Titusville by rail, and situated on the Buffalo, Bradford and Pittsburg road, about twelve miles from Carrolton, on the New York and Erie road. The success of the oil wells at Limestone, in Cattaraugus county, which have been in operation for some years, has had the effect to draw more particular attention to this district of late. The topography of the lands in Bradford corresponds, in a striking manner, with many of the most famous producing tracts of the oil regions. The conglomerate rock is found in great abundance and various dimensions scattered all over the region, and the pebble rock, mixed with white sand, is conspicuous on the roadside, the fields, and the hilltops and ravines. Several wells were put down there five or six years ago, but by inexperienced drillers and companies, and in no case has any record been kept of them, or thorough test made, and yet in all oil has been found in more or less quantities, the green oil and also the amber oil. The time seems now to have arrived for a thorough testing and practical development under the most favorable circumstances. Tens of thousands of acres have been leased, and a number of oil wells are now going down, under the auspices of the Salem Oil Company, the Barnsdall Oil Company, the Independent Oil Company, and other companies, as well as by private parties. So strong is the faith of the people of Bradford, and vicinity in the development, that nearly all the leading men of the vicinity are enlisted in the enterprise, prominent among whom may be mentioned: J. M. Welsh, Carlos Foster, J. W. Hilton, Job Moses, J. R. Pomeroy, C. D. Webster, E. Parsons, J. K. Haffey, J. Broder; and the strongest inducements are held out to outside parties in the way of leases to operate in the district. A number of old operators from the Oil creek region have already taken leases, and have already commenced drilling. The present fall will be a busy season there, and determine the resources of a large extent of territory, embracing tens of thousands of acres. We shall keep our readers posted on the course of development in this section, from time to time. Should paying wells be found at Bradford, a great future is before it, as it possesses many of the elements for making a flourishing town. Coal is plenty there, the mines are only a few miles off, and coal is sold for half what it costs at Titusville, and the railroad already connects Bradford with all the great commercial lines and routes. Titusville will share the benefit of this development in the way of supplying engines and oil well supplies for that region, for some time to come.

Limestone is situated in a beautiful valley, through which the Tunungwant holds its winding course. The upland and valley have a warm, rich soil. The extensive tannery of E. A. & G. W. Pallen, the second in size in the United States, is located at Limestone. The resources of McKean county, in this State, adjoining Catteraugus county, in New York, in lumber, coal, oil, iron, are drawing to it large capital and enterprise for their developmont, and rapid accessions to their population along the line of the Bradford railroad. A mine of mineral paint, on the lands of J. S. Walsh, has been opened, a few miles from the town of Bradford, and the Brooklyn Mineral Paint Company, of New York, are now engaged in its manufacture. It is of a light-brown chocolate color, and can be changed to green, lead, stone, drab, olive or cream, is fire and water proof, and makes No. 1 floor cloths. McKean county is well worth a visit by the capitalists and oil producers of this section.

The Past and Present of Parkers' Landing Oil Field.—In the year 1860, Thomas McConnell, W. D. Robinson, Smith K. Campbell and Col. J. B. Finlay, of Kittanning, purchased two acres of land on the west bank of the Alleghany river, about ninety rods north of Tom's run, from Elisha Robinson, Sr., and organized the "Foxburg Oil Company," consisting of sixteen shares, and commenced putting down a well, which reached a depth of 460 feet, when an accident occured to obstruct the operation for a few days. In the interval the war broke out, and the excitement incident thereto stopped all further work on the premises, and the well was abandoned.

Subsequently the same parties, to-wit, Thomas McConnel, Robinson, Campbell, and Col. Finlay, purchased 100 acres, known as the Tom's Run tract, from Mr. Robinson aforesaid, for which they paid $50 per acre, a price that many considered above the value of the island. In 1865 these gentlemen sold about 30 acres of their purchase to a number of gentlemen in Philadelphia for the sum of $20,000. On these 30 acres the "Clarion and Alleghany River Oil Company" put down their well, which struck oil in October, 1865, the first produced in that region.

Many were the scoffs and jeers and insulting remarks made about the first operators. They were held up to ridicule by men of means as well as by paupers, and euphoniously called "crazy," having "oil on the brain," etc. The followers of these pioneers are now, however, numerous.

It is remarkable that the well of 1860 was put down on territory which has since proved dry; and had it then been finished would have undoubtedly been a failure and possibly prevented all future development in this region. But it was not to be so. It was abandoned for a period of four years before the "Alleghany and Clarion River" well had been commenced, and which, proving a success, gave this field to the world at a time when Venango was rapidly declining in product, and West Virginia, Ohio and Kentucky had "played out."

To-day the Parker oil field is the largest and richest known—its length and width is immense, and unsurpassed by early or late developments in any other section. A large town has sprung into existence, thousands of men are engaged in the pursuits of active, profitable business, and thousands of barrels of oil are shipped monthly from it, adding to its wealth every hour, with no present prospect of its diminution.

Such is Parker, past and present. And it would require the tongue of a prophet to foretell its rapidly developing future.

What is thought of the Oil Business.—We take the following from No. 2 article on mining which appeared in the Titusville *Herald:* Although our production of oil has reached a named result of twenty million dollars per annum, still a large majority of the people of the United States continue to regard the oil business as nothing more than a system of stock operating and failing. A majority of even good business men east of the Mississippi river still hold the great mining enterprises of the west in a similar light, although their combined annual production exceeds one hundred million dollars in coin per annum. And this anomalous state of mind continues while the produce on oil territory is used to light our entire continent, to say nothing of our exportations, and while gold and silver continues as the acknowledged substratum of our circulating medium. But were the productions of these great fields of wealth to stop for a single year, the whole country would very soon realize their importance.

It is a recognized fact that all great inventions and developments in the line of progress have had their vicissitudes and difficulties.

Now we sit in our office in Titusville and operate in the valuable production of our country with all the facility and comfort of a well-regulated banking house, almost forgetting the disadvantages of 1862, when it cost as much to cart a barrel of oil to Union as it does now to produce and place it on shipboard at New York.

Bear Creek.—No. 1 Donnelly, which has been pumping about six months and torpedoed once, has averaged five barrels per day, and is now doing three and one-half barrels. No. 2 has been pumping since the latter part of May, has been torpedoed once, and is now making twelve barrels; has averaged ten barrels. No. 3, which is on the North Branch, has been pumping since March, averaged about three barrels daily; is now making four barrels. No. 4, South Branch, was finished about a month ago, and is only making about one and one-half barrels per bay. The tubing in this well is three and one-eighth inches in diameter, and the sucker-rods are two inches. So far the large tubing and rods are not successful, owing to the immense body of fluid on the sucker, which wears it out in one day. Nos. 5, 6, 8 and 9 are contracted by Mr. Himmilwrigh, of Tarentum. He purposes starting three more immediately, the engines for which he now has in his warehouse, near the Bear creek bridge. A few years ago, after figuring half a day, noting costs, expenses, etc., Mr. Donnelly offered to sell this farm of 1,135 acres for $6 an acre, but the party would not touch it; thought the price was exorbitant. The mineral wealth alone is worth $150 an acre.—*East Brady Independent.*

Drilling in Germany--A 4,000-feet Hole.—The exploring of the salt-layer at Sperenberg, in Lusatia, is being continued with great energy. The first great boring has attained a depth of nearly 4,000 feet, yet the bottom of the bed has not yet been reached. When about half its present depth had been attained, the opinion began to spread that an earthquake had altered the position of the stratum, and that, consequently, the boring must be taken to represent the breadth instead of the depth of the bed. Two other borings were, therefore, begun at a certain distance from the first, and it was discovered that the bed really possessed the extraordinary depth above mentioned. The salt-layer at Segelberg, in Holstein, which is being opened, and that of Inocwraclaw, which is about to be worked, are more favorably situated than that of Sperenberg, as the distance of other salt-mines has hitherto greatly increased the price of the article, and rendered it almost impossible for German salt to compete with that imported from England.

The Salt Lakes of Australia.—A writer in the *Sydney Empire* thus describes the salt lakes in and mineral springs on the Paroo: These wells are a curiosity to many if not to all. Mounds of earth rise about ten or fifteen feet over the surface, no doubt thrown up by the force of the water; they form a kind of oasis in the wilderness, and have saved the lives of many a weary traveler. These mounds can be seen for miles. The water is very clear and soft. It is impregnated with magnesia, soda, and alum. It is very palatable to drink, and I think very wholesome. The water does not flow after touching the surface, but as soon as it overflows the fort-like basin sinks into the earth. The alum and soda crack under your feet as you walk around these wells, like frozen snow. Sand storms occasionally set in with great violence, sweeping along and drifting like snow, but in this it differs, that nothing is proof against its penetrating propensity. It enters your eyes, your nose, your mouth, and your ears, even your very skin seems gritty from it, and everything is covered with it. It enters all culinary matters, so that while it lasts you are continually eating, drinking, and wearing sand. As an instance, the first evening I entered the Paroo, one of the sand storms set in, and after viewing one of those beautiful clear lakes, in which we thought we could quench our thirst—having had nothing to drink since the morning—what was our surprise, I might almost say despair, to find that the water was salt as brine. The driving sand beat with such fury that we could not see each other on the road. Our party numbered five, and I took the bridle and saddle off my horse, and let him go to shift for himself. I lay down, putting the saddle between myself and the storm for shelter; the morning at last came, and I found, at five miles distant, my party, horse, and water.

Great Extension of Mineral Oil Works in Russia.—We learn from an authoritative source [that some very extensive mineral oil works are in course of erection at Riazan, in Russia, two gentlemen being now in England for the purpose of making arrangements as to the necessary machinery. Experiments have been already made with coal obtained in Russia, and the result is said to have been satisfactory in the very highest degree. As regards the mineral, recent explorations have led to the discovery that there are apparently inexhaustible coal mines in Kharloff and Taganrog, and from these oil can be produced in extremely large quantities. Eminent geologists, after most careful examination, have pronounced the mineral to be, some of it anthracite, and some "half-anthracite," while a good quantity of it is called "smolisteougle," or steam coal. We hope soon to be able to place before our readers a detailed account, both as to their extent and the result of the manufacture.

Machine for Testing Lubricating Oils.—Our article on testing lubricating oils, in the July number of the *Journal*, has been quite extensively copied, and, as we have reason to know, has attracted the attention of the large oil consumers generally. We desire to publish such information as will interest and benefit our readers, and shall be pleased to receive from them any hints or suggestions they may have to make, and especially the results of their observation and experience in connection with oil matters. Among those to whom we are under obligations for favors, since our last issue, is A. H. Van Cleve, Esq., general purchasing agent of the Camden and Amboy railroad, who sends us a printed copy of the "Report of experiments made with the Camden and Amboy Railroad and Transportation Company's machine, erected at South Amboy, by A. H. Van Cleve, general purchasing agent, for testing the relative value of lubricating oils." The apparatus, which is to be patented, is described as follows:

An experimental shaft with journals seven inches long, six inches diameter (the size in use under the company's locomotive engines), was carefully fitted to brass bearings, supported by cast iron frames, secured to a suitable foundation. A spur-wheel attached to the centre of the experimental shaft was geared to a pinion-wheel, on the centre of a driving shaft, with its bearings also attached to the cast iron frames. A set of scale beams arranged to apply any required pressure (within their capacity) to the lower half of the brass bearings, were also accurately fitted to the cast iron frames and foundation. The experimental shaft was driven by a five-horse power oscillating engine, at a given number of revolutions per minute.

The velocity was determined by a counter attached to the end of the shaft. The brass bearings of the experimental shaft were kept at an average of 96° Fahrenheit, which was determined by thermometers inserted through them, to within $\frac{3}{8}$ inch of the journals. An oil cup was placed over each bearing, graduated to fractional parts of a gill. A thermometer, to determine the temperature of the oil when applied, was placed in each cup. The experiments proved that the consumption of oil varied with its temperature when applied. The quantity of oil applied per minute was varied at intervals, as was required to keep the bearings as near 100° Fahrenheit as possible, as abrasion of the metals took place when it rose above that point. The total consumption of oil, at the close of each experiment, was averaged with the number of hours occupied in making the experiment. The pressure upon the journals was varied for each kind of oil, as was necessary to preserve the uniform temperature of 96° Fahrenheit, at the required revolutions of the shaft per minute on each experiment. Hence, the number of square feet of the journal's surface traveled per minute, the pounds pressure upon them, and the quantity of oil applied, determined the lubricating value of the oil. The method of applying the pressure by the scale beams, accurately indicated the power consumed by the engine to keep the shaft in motion during the experiments with each kind of oil. A shaft, with journals 6 inches long and $2\frac{3}{4}$ inches diameter (the size now in use under the company's cars), was fitted in place of the 6 inches diameter, and driven at a corresponding number of revolutions per minute, for the purpose of testing the value of car-box oils.—*National Oil Journal.*

Petersburg Oil District.—The excitement in the Petersburg oil district is still on the increase. The number of wells going down is immense. There are a large number of wells going down all along the creek from the upper end of the old Fox estate to the mouth of Turkey Run, a distance of several miles, and with as good indications and as much certainty of getting good wells as at any other place in the Pennsylvania oil regions. Some idea of the extent of business and operating done in the Petersburg oil district can be formed by staying at Foxburg from twelve till five o'clock any afternoon, and see the number of passengers that get on and off the trains, and see the number of cars that are being unloaded. There is a large addition being made to the side-track to accommodate the increasing business. There is also a large hotel and a number of other buildings being put up, which, when finished, will give Foxburg the appearance of a town. Petersburg, by present indications, is likely to be quite a place. Several hardware and other stores are being built there, and a large number of other buildings are going up, and at the rate that things are generally done in the oil regions.—*Emlenton Sun.*

Foreign Tax on Petroleum.—The increased duties lately imposed by the French National Assembly upon petroleum and schist oils, it is stated, will seriously interfere with the trade between Great Britain and France in these articles. The British coal oil, it may be remembered, is distilled from schist, or bituminous shales. Under the old treaty between Great Britain and France, it was stipulated that mineral oils of English manufacture should pay a duty of five per cent. upon their value, which generally amounted to one cent and a half a gallon. Under the old commercial arrangements petroleum paid a duty of four cents a gallon. The new French duties, however, tax coal oils of English and European manufacture at twenty-four cents, while American oils are admitted at twenty cents a gallon. The dealers in English coal oils are making bitter complaints in reference to this alleged discrimination against the product of their manufacture. A recent letter in the London *Times* states that American petroleum has a marked value in France of twenty per cent. over British mineral oil, and that it is doubtful whether even at equal duties the British manufacturer could retain any footing in the French market. It is further contended that American petroleum, being admitted at a duty of four cents less on the gallon, will entirely exclude British oils from the French market. It is also stated that several ships are now lying at Dunkirk laden with British oils, for which they cannot obtain a market in consequence of the high prices caused by the increased duties.

Oil Excitement at Fort Scott, Kansas.—We clip the following from the Fort Scott *Monitor*, of September 1st.:

FORT SCOTT, Aug. 23.

Editor Monitor: Please allow me to call attention to the fact that there is a strong probability that within twenty-five miles of our city there is a most flattering prospect of bringing to the surface of mother earth great quantities of petroleum. Near Leroy, in Barton county, Missouri, is a man, Dr. Paul Gregory, who is laboring to develop the resources of that wonderful region, and he invites any one interested in the prosperity of our South-west, to come and visit him on the ground where he is operating. The doctor writes to me that from some of the oil springs a barrel of oil per day can be dipped, and a specimen of it is already in the museum of the Monitor Reading Room. Some say that much oil at the surface is ominous of but little beneath. The doctor knocks that endways in the following manner: Common sense tells us that much oil could not rise if there were not a large deposit beneath, and it proves also, that where there have been so great upheavals of earth and rocks, even down to the old fourth sand-rock, crevices have been made in the rock through which the oil has been forced up by the gas it contains. It proves two things: First, that the rock has been *terribly* shaken, and secondly, that the oil is there, or it could not come up.

For one, I am interested in this matter, and wish Fort Scott to have a hand in the enterprise.

NATHANIEL WARNER.

Petroleum for Locomotives.—A French inventor proposes the use of petroleum for locomotives, and recently exhibited a model of a small engine heated by this means, for which complete success is claimed. This locomotive carries two thousand litres, or about five hundred gallons of oil, in the tender, a hand pump forcing the oil into a small reservoir near the boiler. The process of lighting the oil is said to be neither difficult nor dangerous, owing to the oil being kept in compartments, a small quantity only being lighted at one time, then another division, and so on, until the whole furnace is lighted. This engine consumes its own smoke perfectly, and it is said to be extremely easy to drive, on account of the simplicity of the apparatus. A larger locomotive, with slight improvements, has since been built, and successful trials made of its working qualities. The consumption of oil was thirty-five per cent. less by weight than that of good patent compressed coal, a little more than two pounds of oil producing twenty-five pounds.

Petroleum Tracing Paper.—Mr. Hausel, architect at Neustadt, Grand Duchy of Hesse, being unexpectedly in need of some tracing paper on a certain occasion in a small village, where none could be obtained, thought of using as a substitute ordinary writing paper saturated with petroleum by means of a brush. The effect was a surprising success. It did not take him more than four or five minutes to paint a sheet of writing paper with petroleum and to wipe it off till it was dry. He obtained an excellent tracing paper, on which he could write and paint just as easily as if it had not been subjected to any such process. Drawing paper, also, becomes sufficiently transparent to be used for tracings. Mr. Hausel has entirely abandoned the use of manufactured tracing paper.

Lubricating Oils and the Microscope.—For detecting impurities and injurious matter in lubricating oils, and especially in the numerous dark petroleum oils offered for sale, the ordinary microscope may be used to great advantage. If pure natural petroleum has been thoroughly settled, as it always should be before being barreled for use, the closest scrutiny will fail to detect in it any impure or foreign substance, and under the glass will appear clear, bright, and transparent. Oil of this description can be used with perfect safety on the finest machinery, and, if of proper gravity, will always be found a good lubricator. Fresh-pumped oil, if placed under the microscope, will be found to hold in suspension crystalized paraffine, and very minute particles of water and of rotten stone, all of which are injurious to machinery. All of these impurities may be precipitated by allowing the oil to stand in tank for a sufficient length of time. By slightly warming the oil, the work of purification may be accelerated.

These natural oils are largely adulterterated with what is called "still-bottoms," or residuum. This tarry material is produced in large quantities and at a nominal cost, in refining petroleum, and is filled with small, hard particles of decomposed oil, or carbon, caused by the intense heat, to which the oil is subjected in the still. There need be no trouble in detecting oil adulterated in this manner, even with a microscope of quite limited power. A small fraction of a single drop placed under the glass and the whole field will appear covered with these numerous opake particles floating in the oil. The observer will wonder why they do not destroy the machinery more rapidly than they do. The cost of a microscope is trifling, compared with the injury often done to machinery, and oil consumers should be prepared to protect themselves against this kind of mixtures.

Oil on Dunkard's Creek.—The Monongahela *Republican* has the following: That there is plenty of oil of a very superior quality on Dunkard's creek, Greene county, good judges have never doubted. In 1864–5, the excitement ran high, and the wildest speculation was rife on all hands. Companies were formed in haste with small capital and inexperienced men put to work. Exorbitant prices for material and labor, bad workmanship, big salaries to superintendents, etc., soon spent the working capital of the companies formed, and got them hopelessly in debt. Nearly all were sold out by the sheriffs and constables. The business went down, many lost their investments and believed all to be a humbug. A few tenacious men, who had faith in ultimate success, hung on to make the production of oil on Dunkard a legitimate, paying business, instead of a "shystering" speculation, and we are rejoiced to know that their efforts have been successful, and they are now about to be reimbursed for their great outlays. When persons now go to Dunkard they see realities instead of fictitious values. They see business men instead of "shystering" speculators. Men of capital from Oil City, Titusville, Pittsburgh, Philadelphia, and Uniontown, have substantial material on the creek, with experienced workmen, and are driving down several new wells, eight inches in diameter, with the best of prospects, and in good spirits.

Preventing Explosions.—The record of English patents shows one designed to prevent explosions of steam boilers, which at this time, when public attention is called to that subject by the Westfield horror, may be worth notice. This improved means of preventing explosions consists in providing a hole in the upper part of the boiler, and covering the same with a material (India rubber for example) of sufficient strength to withstand ordinary pressures, but which will give way and allow of the escape of steam under excessive pressure. The India rubber is clamped to the boiler by a flanged tube formed for the purpose.

Are Refineries a Nuisance? Effects upon Health.—We take the following from the Titusville *Herald:* An interesting case was recently brought before the Central Criminal Court of Boston, for the purpose of proving that an oil refinery is a nuisance. The parties were the Commonwealth *vs.* Jerome G. Kidder and A. Abbott Vaughen, proprietors of the kerosene refinery at Winthrop. One of the witnesses swore that he had been made so sick by passing the refinery, that he was unwell for two weeks afterward. On the other hand, the defense introduced scientific authorities to prove that the gases eliminated from the works were far from being deleterious in their effects upon health; on the contrary, they were well known disinfectants, and beneficial rather than injurious to health. It is altogether probable that the individual who was made sick in passing that refinery, would have become sick whether he had passed that way or gone in another direction. It is well known that the vapors of petroleum are highly beneficial to invalids. So clearly established is this fact, that consumptives have sought residence in this region on that account, and have derived great benefit from inhaling the petroleum atmosphere in the vicinity of producing wells. Carbolic acid is a product of petroleum, and it is one of the most powerful disinfectants known. Petroleum, taken either into the blood through the lungs, or in small quantities through the skin, has a marvelous remedial effect in many forms of disease. No one was ever known before to have been injured by simply breathing an atmosphere so slightly impregnated with petroleum vapor as could have been the case at the refinery at Winthrop. Men have become intoxicated by an atmosphere too strongly charged with petroleum; it, however, has an exhilerating, and not a nauseating effect. Those who return to the region after a long absence derive as much pleasure on their approach to our wells, as an old tar, who has not had a sniff of salt water for a year or two, when he returns to the sea-girt shore. Our atmosphere is healthy and exhilerating, and we recommend this sick man of Boston to come and see how it is himself.

Steam Gauges. — The Titusville *Herald* says: Next to the water gauge cocks, there is nothing so important in running a boiler as an accurate steam gauge. It is a matter of surprise that more accidents do not take place from defective steam gauges than are recorded. Within the past six weeks one firm alone in this city has inspected twenty-eight of these gauges of every make, and most of them averaged forty pounds less than the actual pressure which it was intended for them to indicate. That is to say, when they indicated a pressure of eighty pounds on a boiler, the actual pressure was 120 pounds to the square inch. The delicate mechanism of which these steam gauges are made up, renders them extremely liable to get out of order, nor is it every engineer who can accurately correct them. This can only be done by an experienced gauge manufacturer. There is nothing more common, especially among our well engineers, than to place an extra weight upon the safety valve to make it correspond with the steam gauge. This is very reprehensible and fraught with extreme danger, as in that case there is no correct standpoint to accurately indicate the internal pressure. Whenever a steam gauge refuses to indicate the same pressure as the safety valve, the only plan is to have the steam gauge readjusted by the Ashcroft test, and by an experienced hand.

The Markets.

We present in the table below the highest prices on the Upper and Lower Roads for each day of the month; and following that the average price for each month of the year.

DATE.		UPPER CREEK.	LOWER CREEK.
Sept........	1	$4,60	$4,75
"	2	4,60	4,75
"	4	4,60	4,75
"	5	4,57½	4,77½
"	6	4,55	4,75
"	7	4,55	4,70
"	8	4,52½	4,70
"	9	4,50	4,70
"	11	4,50	4,65
"	12	4,50	4,67½
"	13	4,50	4,70
"	14	4,52½	4,75
"	15	4,65	4,75
"	16	4,60	4,80
"	18	4,60	4,80
"	19	4,60	4,80
"	20	4,62½	4,77½
"	21	4,65	4,77½
"	22	4,70	4,80
"	23	4,72½	4,82½
"	25	4,80	4,85
"	26	4,77½	4,85
"	27	4,80	4,85
"	28	4,75	4,85
"	29	4,75	4,85
"	30	4,75	4,85

AVERAGE PRICES.

			U. Creek.	L. Creek.
Average	price in	January..	$3,83.5	$4,03.2
"	"	February	4,34.7	4,48.0
"	"	March....	4,20.2	4,25.3
"	"	April......	3,92.5	3,96.1
"	"	May.......	4,44.2	4,64.3
"	"	June.......	4,78.9	5,02.2
"	"	July.....	4,57.3	4,84.0
"	"	August...	4,34.8	4,67.7
"	"	Sept......	4,55.9	4,74.6

REPORT OF SHIPMENTS AND STOCK.

SHIPMENTS REDUCED TO 43 GAL. PER BARREL.

September.	Refi'd	Crude Equal	Crude.	Totals
O. C. & A. R. R..	64,064	91,520	112,360	203,880
A. & G. W. R. R..	54	77	76,073	76,150
A. V. R. R.......	0	0	123,176	123,176
J. & F. R. R.......	0	0	140,023	140,023
P. & E. R. R.....	0	0	7,846	7,846
By River........	0	0	0	0
Total........	64,118	91,597	459,478	551,07

Stock at Wells Sept. 30th..............	89,854
Stock in Iron Tanks Sept. 30th.......	343,320
In hand of Refiners and Pipe Companies, not reported in the above..	49,455
Total................................	482,629
Total shipments for Aug. (bbls.)......	550,571
Total stock on hand Aug. 31st, (bbls.)	523,587

☞In reducing Refined Oil to "Crude Equal," as per above table, we calculate on the basis that 100 barrels of Crude produces pruduces 70 barrels of Refined.

REPORT OF THE PETROLEUM PRODUCERS' ASSOCIATION,

FOR THE MONTH OF SEPTEMBER, 1871.

DISTRICTS REPRESENTED.	No. Bbls. Oil on hand at wells at close of month.	Daily average for the mo., containing 30 days.	No. wells prod'ng during the mo'th.	Daily average, per well for month	Wells being dril'd.	No. of barrels in Iron Tanks.
1 Parker's Landing	23,342	2,852.7	525	5.4	180	25,250
2 Emlenton	400	45	19	2.4	0	0
3 Scrubgrass	412	145.3	43	3.4	3	0
4 Foster..	0	38	25	1.5	2	0
5 Coal City	1,390	207.2	30	6.9	1	0
6 Prentice, Angell, Co	2,393	420.7	27	15.5	10	0
7 Cochran....	600	80	60	1.3	0	0
8 Franklin	3,770	263.9	73	3.6	5	8,700
9 Reno	200	336.6	38	8.8	4	0
10 Oil City..............	2,905	367.5	163	2.2	8	32,816
11 Venango City......	2,202	755.5	116	6.5	53	26,734
12 Siverly...	0	97	32	3	3	0
13 Oleopolis............	0	39.5	16	2.5	2	21,137
14 West Hickory.....	15,406	1,376.9	211	6.5	25	17,539
15 Tidioute..............	5,116	1,162.3	145	8	17	38,414
16 Economy	2,254	137.5	32	4.3	0	0
17 Holmden	659	249.6	54	4 6	12	315
18 West Pithole......	100	181.1	83	2 2	2	0
19 McClintockville...	847	155.7	57	2.7	4	0
20 Rouseville..........	505	405.3	117	3.5	2	600
21 Lower Cherry Run	1,172	276.4	103	2 7	0	0
22 Rynd & Steele.....	2,193	159.5	48	3 3	0	3,600
23 Blood & Tarr......	2,345	184 4	59	3.1	2	1,100
24 Columbia...........	8,781	829.6	148	5.6	4	16,524
25 Moffat	1,000	337.8	128	2.6	9	0
26 Niagara..............	506	118.7	50	2.4	0	0
27 Wood & Stevenson	138	56.3	20	2.8	0	17,863
28 Petroleum Centre	390	190.3	46	4.1	0	41,412
29 McElheny.........	387	72.9	31	2.3	1	47,592
30 Sherman............	0	15	4	3.7	0	0
31 Clinton.....	1,096	46.4	28	1.6	2	0
32 Great Republic....	815	367.8	151	2.4	6	0
33 Atkinson...	240	96.1	30	3.2	0	0
34 Shamburg..........	1,123	221.3	76	2.9	1	0
35 Keech Farm.......	0	55.4	28	2	4	0
36 Independent........	1,000	226	82	2.8	2	0
37 National	220	187.3	46	4.1	5	95,13
38 Davis..................	69	21.5	11	2	0	0
39 Armstrong.........	0	110	41	2.7	2	0
40 Vesta & Hebert....	530	57	15	3.8	0	0
41 Gerow	700	165	51	3.2	7	0
42 Nettleton...........	35	33.5	17	2	1	0
43 Enterprise..........	230	66.9	13	5.1	9	0
44 Bean..................	0	264	133	2	1	0
45 Titusville............	3,700	1,504.5	198	7.6	21	19,659
46 Armstrong Run...	1,200	264.2	28	9.4	23	0
47 Colorado	483	152.5	15	10.1	6	0
48 Miller & Shaffer...	0	0	0	0	0	14,912
Totals................	89,854	15,398.2	3,466	4.4	439	343.320

N. B.—The amount of Lubricating Oil produced during Sept. was 7,917 barrels.

TORPEDOES.

THE

Roberts Petroleum Torpedo Co.,

OFFICE AT RED PLANING MILL,

Corner of Pine and Second Streets,

Titusville, Penn'a.

Owing to the large and increasing demand for the Roberts Torpedoes, and the late decision of the Commissioner of Patents, in refusing to Wm. Reed a patent, and the decision of Judge R. C. Grier, sustaining the Roberts Patent, they have lowered the price of their Torpedoes TWENTY PER CENT., so that every operator can afford to try a Torpedo before abandoning a well.

LIST OF AGENTS.

Titusville, Church Run and vicinity,	H. H. Thomas, or Stephen Roof, Titusville, Pa.
hamburg and vicinity,	George Irwin, Shamburg, Pa.
Enterprise, Pleasantville, Bean Farm and Pithole,	Goorge W. Van Vliet, Pleasantville, Pa.
Tidioute and West Hickory,	Charles Clark, Tidioute, Pa.
Petroleum Centre and vicinity,	Levi Mason, Petroleum Centre, Pa.
Tarr and Blood Farms, Rouseville, Cherry Run and vicinity,	James Saunders, Tarr Farm, Pa.
Franklin,	Z. Wilber, Franklin, Pa
Scrubgrass and Parker's Landing,	Richard W. Redfield, Scrubgrass, Pa
West Virginia, Ohio and Kentucky	T F. Cook, Parkersburg, West Va